PRESENTATION OF THE ACADEMY MEDAL TO SOLOMON A. BERSON, M.D.*

ALEXANDER B. GUTMAN, M.D.

Professor Emeritus of Medicine
The Mount Sinai School of Medicine
of the
City University of New York
New York, N. Y.

EACH year the New York Academy of Medicine awards its Academy Medal for signal achievement in the field of medical science. This year another outstanding scientist, Dr. Solomon A. Berson, is added to the long list of distinguished recipients. It is an honor and a great personal pleasure for me to be invited to read the citation.

In 1951 there began to appear in the medical literature studies by Dr. Berson and Dr. Rosalyn S. Yalow, and soon Berson and Yalow, Yalow and Berson, became a familiar refrain. In the early 1950's this collaborative effort was directed chiefly toward measurements of the blood volume, including the first simultaneous measurements with radioisotope tags on both red cells and serum albumin. These investigations led to a classic paper in 1953 on the kinetics of distribution and metabolism of tagged serum albumin, describing distinct compartments characterized by rapid and slow exchange rates, together with estimates of the rate of synthesis of albumin. The problems of protection of protein carriers so employed were later clarified by an intensive investigation of the radiation chemistry of labeled proteins.

In the early 1950's there also began a series of studies of iodide kinetics, based on plasma ^{131}I clearance rates, with the demonstration that the trapping of iodine is the rate-limiting step in the accumulation of iodide in the thyroid gland. An authoritative review in 1956 summarized the pathways of iodine metabolism.

In 1956 Drs. Berson and Yalow turned their attention to what was soon shown to be a particularly fruitful field, the demonstration and measurement of antibodies to polypeptide hormones, with the formation of soluble antigen-antibody complexes. Using tracer doses of ^{131}I insulin,

*Presented at the Annual Meeting of the New York Academy of Medicine, April 21, 1971.

SOLOMON A. BERSON, M.D.

they were able to clarify many of the discrepancies introduced by less specific biological assays for insulin, and to define the nature of resistance to insulin. Similar studies with human growth hormone revealed the presence of antibodies in man, which explained growth-hormone resistance in treated patients. The unsuspectedly high energy of antigen-antibody reactions was demonstrated in a basic paper that appeared in 1959.

Seeking an even more refined methodology, an ingenious radioimmunoassay for plasma insulin was described in 1959. The sensitivity and specificity of this approach opened up a new era of research into the pathophysiology of diabetes mellitus, notably maturity onset diabetes. In 1963 the method was extended to the assay of parathyroid hormone and of growth hormone in the plasma, then ACTH and gastrin, which disclosed among other things the unsuspected heterogeneity of plasma hormones. In due course, in laboratories in many countries, the principle of radioimmunoassay was applied to numerous other polypeptide hormones, such as glucagon, thyroid-stimulating hormone, follicle-stimulating hormones, calcitonin, vasopressin, angiotensin, etc. Using antibody as the specific reactor, radioimmunoassay is applicable to other immune systems involving a variety of nonpeptidal hormones (aldosterone, testosterone, estradiol, etc.) and nonhormonal substances. A striking example in this last category is the Australia antigen, as described by Walsh, Yalow, and Berson in 1970. Indeed, so versatile is the principle of radioimmunoassay that it can be applied to nonimmune systems if a suitable specific reactor is available, and it has been so employed to measure a variety of hormones and nonhormonal substances. It is in appreciation of the importance of this new tool in biological research, and of Dr. Berson's perceptiveness in applying and interpreting it that the Academy Medal is awarded.

Born in New York City in 1918, Dr. Berson received his undergraduate training at the City College of New York, and in 1945 his M.D. degree at New York University College of Medicine. After completing his internship at Boston City Hospital he returned to New York in 1948 for residency training in medicine at the Bronx Veterans Administration Hospital. There he was soon appointed to the Radioisotope Unit, of which he became chief in 1954, and it was here that, with Dr. Yalow and a series of fellows, he made the remarkable advances already described. In 1968 Dr. Berson assumed his present responsibilities as professor and chairman of the Department of Medicine, The Mount Sinai

School of Medicine of the City University of New York, and director of the Department of Medicine, The Mount Sinai Hospital.

Dr. Berson has been elected to membership in many medical societies, including the American Society for Clinical Investigation and the Association of American Physicians, and to honorary membership in a number of similar societies abroad. His counsel has been widely sought: by the National Institutes of Health where he served on the National Advisory Council of the National Institute of Arthritis and Metabolic Diseases and on the Board of Scientific Counselors of the same Institute, and by the World Health Organization among other organizations. For many years he was a member of the editorial board of several journals, including the *Journal of Clinical Investigation*. He has been in great demand as a lecturer here and abroad, and was a Harvey Society Lecturer in 1966.

Dr. Berson's accomplishments in research have been recognized by the conferring of many other honors, several of them accepted jointly with Dr. Yalow. In 1957 he received the first Eli Lilly Award of the American Diabetes Association, followed in 1965 by their Banting Medal. In 1960 he was given the first William S. Middleton Medical Research Award of the Veterans Administration. Long Island University bestowed an honorary doctorate degree in 1966. In 1968 he received the Van Slyke Award and Medal and, from the University of Liege, Belgium, its University Medal. The Swedish Medical Society awarded him its coveted Medal in 1970. Thus far in 1971 he has received the American College of Physicians Award for distinguished contributions to science as related to medicine, the Howard Taylor Ricketts Memorial Award, and now the Medal of the New York Academy of Medicine.